

Vitamin D Deficiency and Pregnancy

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What is Vitamin D?

Vitamin D is a fat-soluble vitamin that plays a central role in calcium and phosphorous metabolism, which is critical for bone formation and maintenance.

Why is Vitamin D important?

Years ago, deficiency of this vitamin resulted in rickets. New studies have demonstrated a resurfacing of Vitamin D deficiency worldwide. This deficiency is especially critical in the pregnant and lactating woman. Studies have shown how important Vitamin D is to skeletal, cardiovascular, and neurological development in the infant. Other studies have shown Vitamin D deficiency to be linked to diabetes, asthma, and schizophrenia in children. Infants born to mothers with Vitamin D deficiency had poor growth, and defects in enamel formation of teeth. A newborn's Vitamin D level is completely dependent on maternal levels.

Vitamin D is believed to be critical in placental development and function, which may be associated with other complications during pregnancy including miscarriage, preeclampsia, and preterm birth. Low Vitamin D levels have been linked to bacterial infections in the vagina in the first trimester of pregnancy. This can increase the risk of preterm birth and adverse pregnancy outcomes. One study found a four-fold greater risk of cesarean section for women with low Vitamin D levels. This may be due to the fact that skeletal muscle contains Vitamin D receptors and deficiency can result in muscle weakness and poor strength in labor. Vitamin D also regulates calcium levels and, with deficiency, muscle strength is lowered in labor.

Where do we get Vitamin D?

Exposure to sunlight – An inactive form of Vitamin D is synthesized in the skin by exposure to ultraviolet light, and the inactive form is converted to the active form by the liver and the kidney.

Diet – Very few food sources naturally contain vitamin D. Examples are oily fish such as salmon, sardines, mackerel, and tuna along with egg yolks, and fish liver oils. Foods such as milk, orange juice, some cereals, yogurt, cheese, and butter are often fortified with Vitamin D.

Supplements – Over-the-counter supplements are

precursors to Vitamin D, which get converted in the body.

What is considered to be a Vitamin D deficiency?

Deficiency is defined as serum levels of less than 20 mg/ml of 25-hydroxy Vitamin D. Levels between 20 and 30 mg/ml indicate insufficiency, and anything above 30 mg/ml is considered normal. Toxic levels are over 150 mg/ml and are exceedingly rare.

Deficiencies appear to be more common among African-Americans, due to high levels of melanin which blocks light from entering the skin. In addition, levels are lower in the winter months (November through March) when less sunlight reaches the earth. Levels are low in people living above 30 degrees latitude, in cultures where the skin is covered (e.g. Arab countries), and in cultures where people avoid sunlight and use sunscreen.

Certain medical conditions make one more prone to deficiency such as individuals with bowel absorption problems, people with renal disease, obese individuals, vegetarians, people with lactose intolerance, and people on certain medications, including anticonvulsants.

What are the requirements for vitamin D in pregnant and lactating women?

Current research has shown that pregnant women are at high risk of Vitamin D insufficiency and prenatal vitamins are inadequate to meet these demands. Current vitamin preparations have approximately 200 to 400 IU of Vitamin D. Experts recommend 1400 to 2000 IU of Vitamin D per day during pregnancy. This can be accomplished with regular prenatal vitamins in addition to another supplement. It has been suggested that breastfeeding women, whose infants only get vitamin D from breast milk, need to ingest 4000 to 6000 IU of Vitamin D per day.

Serum Vitamin D levels should be determined at the first prenatal visit along with the other prenatal blood work. If women are Vitamin D deficient, they should be treated with 2000 IU of vitamin D in addition to their prenatal vitamins for 1-2 months and the blood test repeated to confirm that the serum level is above 30 mg/ml. With continued supplementation of 1000 IU of Vitamin D per day, levels should be sufficient for the remainder of the pregnancy. Borderline individuals might need to be tested again during the third trimester.

Ultraviolet light exposure can also increase the vitamin D content of human milk.

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